

Renovating Pastures with Livestock

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I want to improve my farm, what should I plant?

- For the first 3 years plant nothing but fence posts and water lines
- Manage grazing and see what happens naturally
 - Choose the right animal/animals for the job
 - You'll probably be surprised what a little management will do to improve pasture health, diversity and quality
- Find the weak spots in the system
 - Gaps in forage supply
 - Areas that still need help
- Then... renovate and plant only those areas that need additional help

Renovating Pastures with Livestock

- Landscapes can be manipulated by:
 - Cow
 - Plow
 - Match
 - Axe

adapted from Aldo Leopold, *Game Management*, 1933

- These tools are all still available; but most often we reach for the heavy metal, fossil fuel or chemical to do the job and overlook the value of the grazing animal as a landscape tool

Grazing Management Techniques to Renovate Pasture

- Management intensive Grazing
- High Stock Density Grazing
- Alternate/multiple species grazing

Management-intensive Grazing

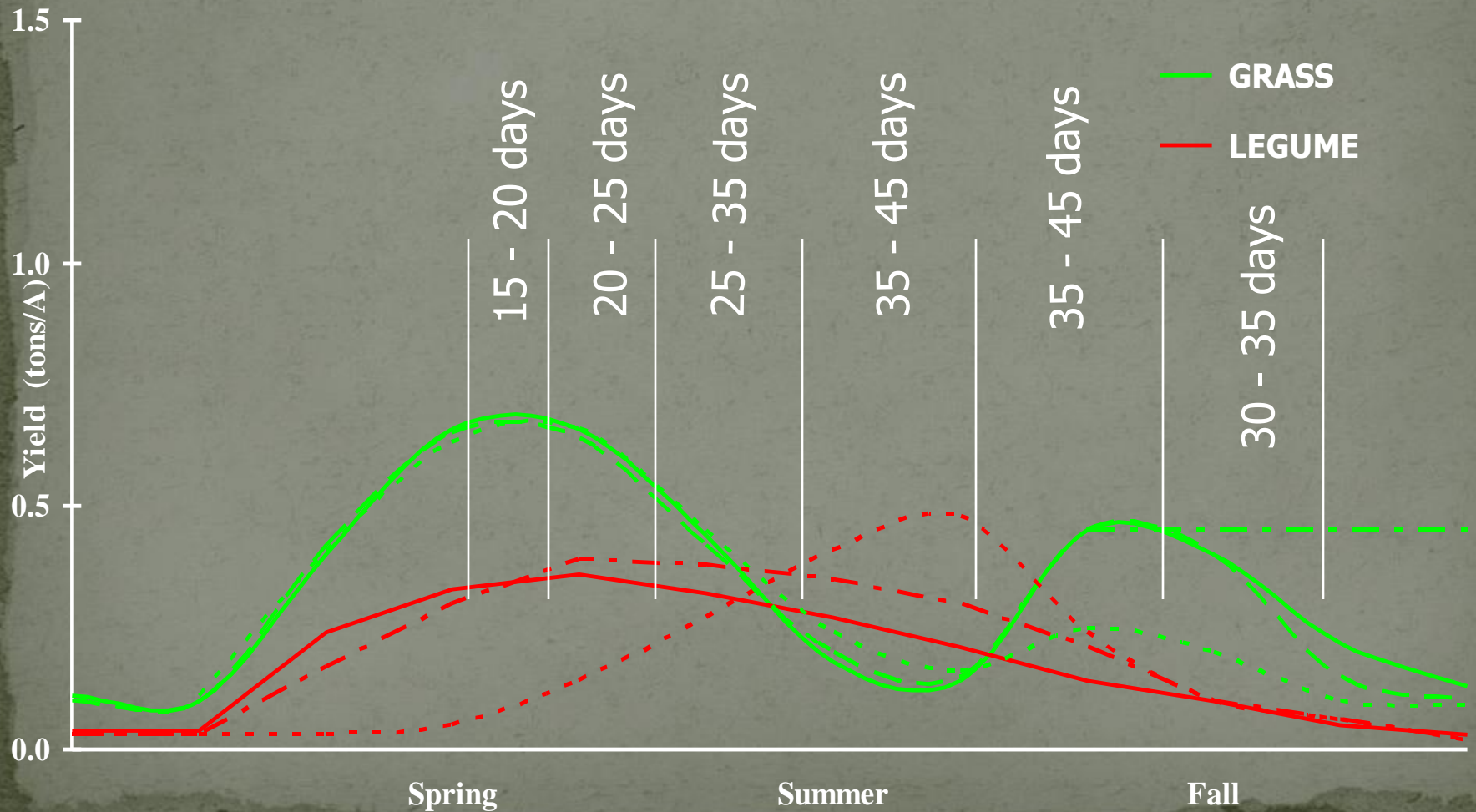
- A goal driven approach to managing grassland resources for long term sustainability



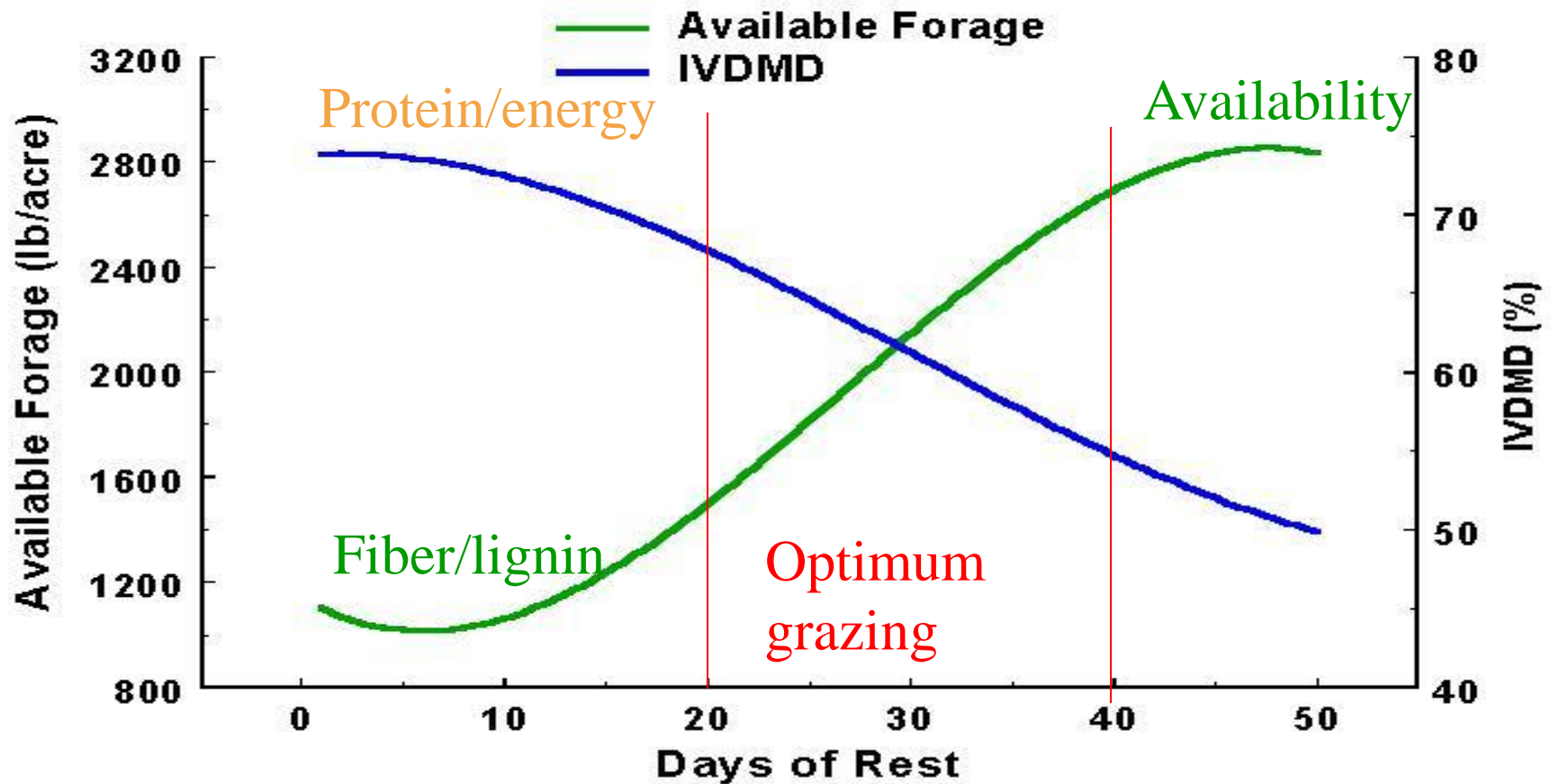
Management-intensive Grazing

- A goal driven approach to managing grassland resources for long term sustainability; ≥ 8 pastures based on plant growth and animal needs
 - 8 – 80+ pastures
 - Grazing periods: 0.5 day – 5 days
 - Rest periods: 20 – 40+ days
 - Stock density: 10,000 – 100,000 lbs.
 - Utilization: 50 – 70%
 - Lower selectivity

Rest Period Needs: Grazing Season



The Availability - Quality Compromise



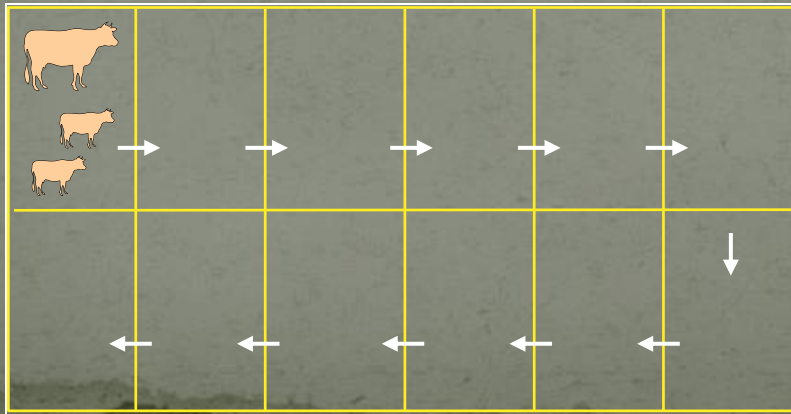
Plant Growth and Management:

During grazing periods: control stubble height

- not too low—keep growing points
- not too low—good photosynthesis
- not too low—keep roots growing
- Not too low-adequate animal intake

Between grazing periods: schedule rest periods

- allow photosynthesis
- allow leaves to regrow-bite size
- allow leaves to regrow-replenish carbohydrates
- allow “vegetative reproduction”

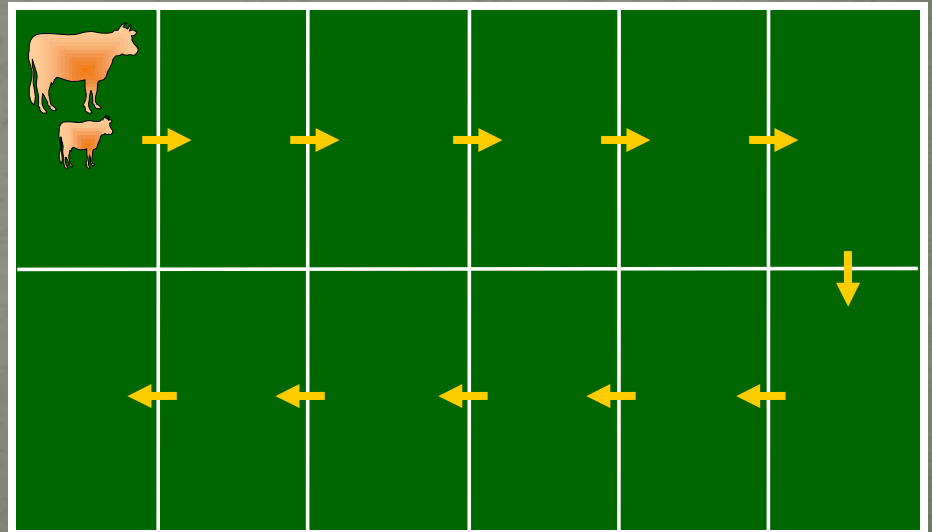


Optimum Paddock #'s based on Livestock Type (Rule of Thumb for 20 – 40 days rest)

Livestock type	Grazing Period (Days)	Paddock #
Dairy & Beef finishing	0.5 – 1	20 - 80
Dairy Heifer & Beef Stockers	1 - 2	16 - 40
Cow/calf, Sheep, Goats, Horses	2 - 5	8 - 16

Benefits of Management-intensive grazing

- Improved legume persistence
 - Reduced N fertilizer requirement
- Better manure distribution/nutrient recycling
 - Reduced P & K fertilizer requirement
- Improved soil health/condition
- Improved pasture condition/health
- Improved forage quality/animal performance
- Increased carrying capacity
- Other benefits
 - *Extended grazing season*
 - *Improved livestock mgmt./herd health*
 - *Improved wildlife habitat*
- Environmentally and economically sustainable



Mob Grazing – High Density Grazing

- Grazing by relatively large numbers of animals at a high stock density for a short period of time
 - Paddock Number: Infinite
 - Grazing Period: Minutes – 1 day
 - Rest period: 30 days – 180 days
 - Stock Density: 50,000 lbs – 500,000 + lbs.
 - Utilization: 60 – 80%
 - Lowest selectivity

Mob Grazing

- Developed and promoted by Allan Savory, Holistic Management International
- Goal is to use animal impact to improve the land
- Grazing a taller fully rested plant vs immature plant. (late 2nd stage into phase 3)
- Ideally, 50 - 60% consumed and the rest trampled into the soil surface
- If you overgraze, give a longer rest period, let tops and roots fully recover

What is “Stock Density”??

- **Stock density:** The number of animals or animal live weight assigned to a specific pasture area for a specific time period.
 - Stock density is a very powerful tool to manage grassland resources (improve utilization, reduce spot grazing/selectivity, control competition, manure distribution, produce seed/soil contact, open up a sward for overseeding)

$$\frac{50,000 \text{ lbs Beef (40 cows)}}{10 \text{ acres}}$$

$$\text{Stock Density} = 5000 \text{ lbs live weight / acre}$$

$$\frac{50,000 \text{ lbs Beef (40 cows)}}{1 \text{ acre}}$$

$$\text{Stock Density} = 50,000 \text{ lbs live weight / acre}$$

$$\frac{50,000 \text{ lbs Beef (40 cows)}}{1/4 \text{ acre}}$$

$$\text{Stock Density} = 200,000 \text{ lbs live weight / acre}$$

Stock Density



Mob Grazing

2 modes

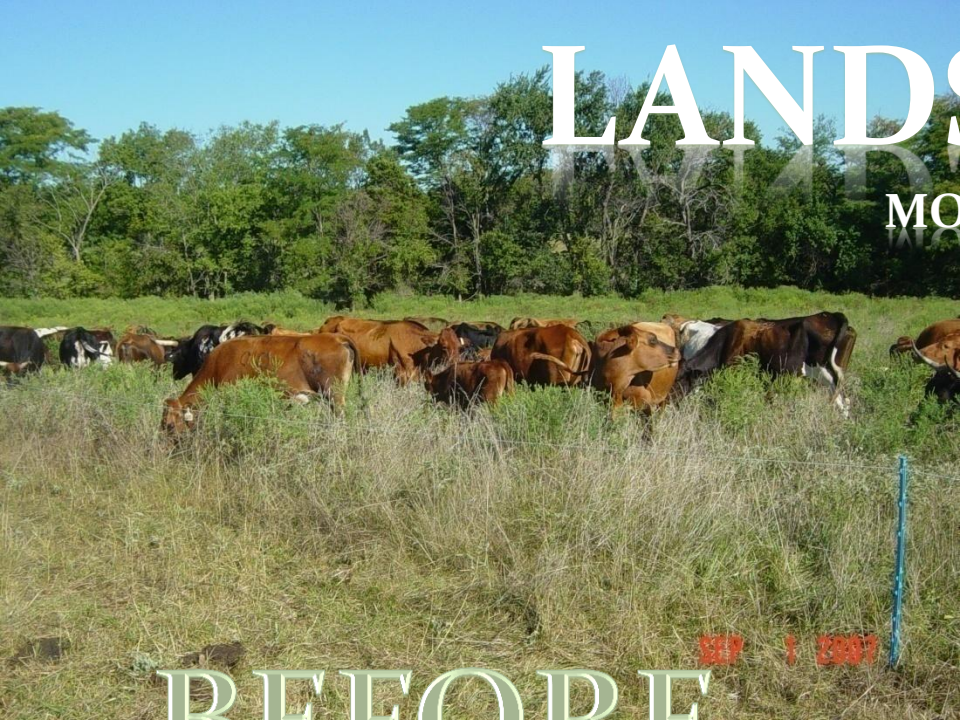
- Landscape – higher density to create a greater effect on the landscape
- Animal performance – a little lower density to allow animals to select the best and tramp the rest

Most valuable tool is a dry bred cow for landscape mode. Very low nutritional requirements. Will eat about any forage.



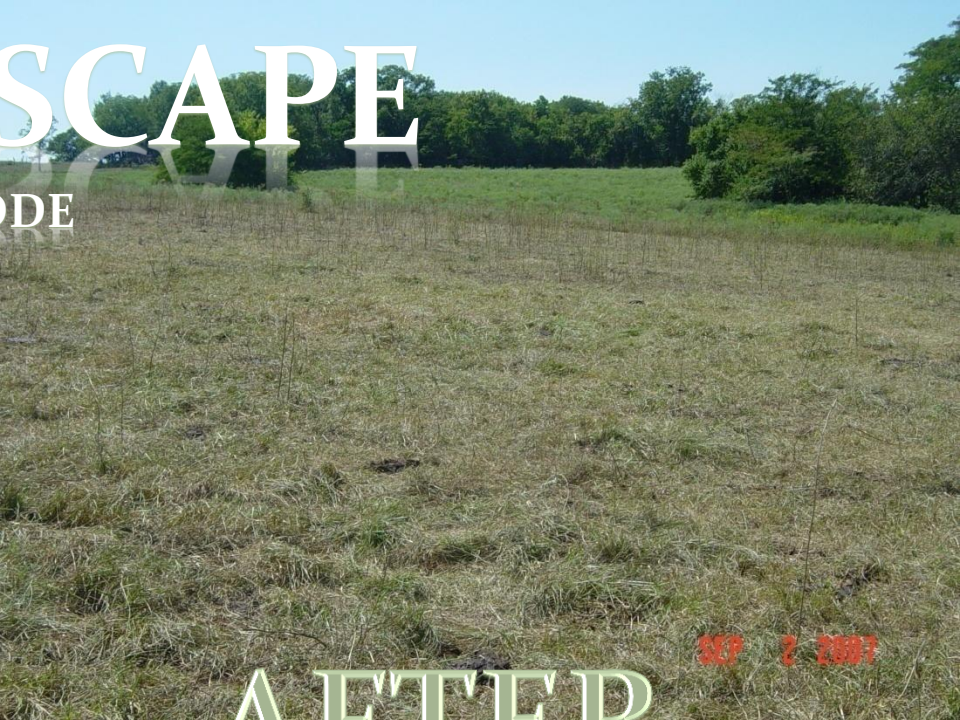
LANDSCAPE

MODE



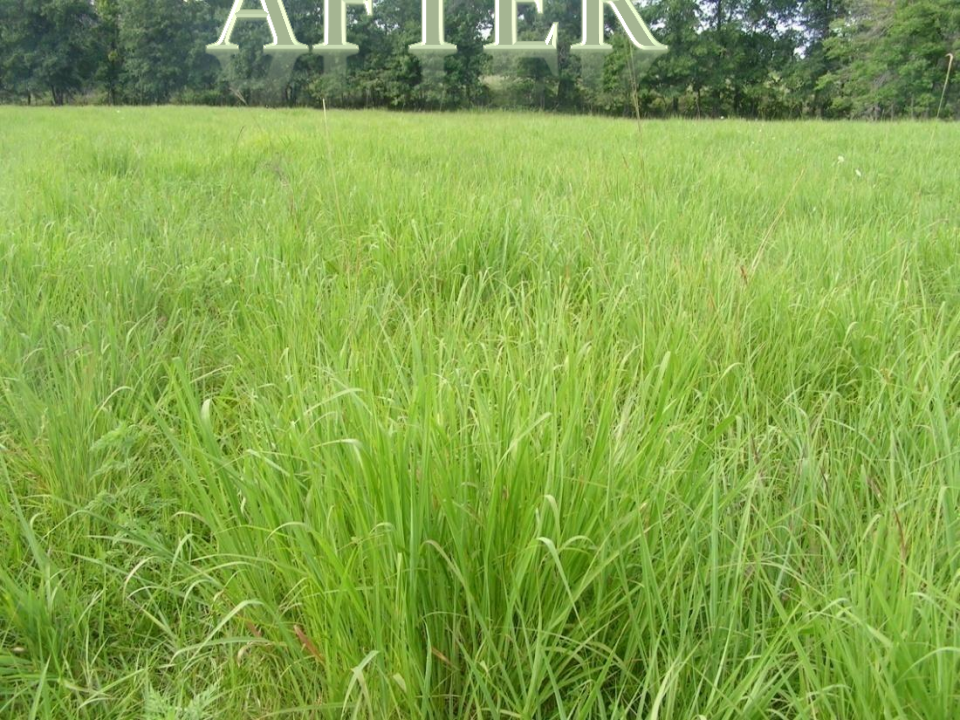
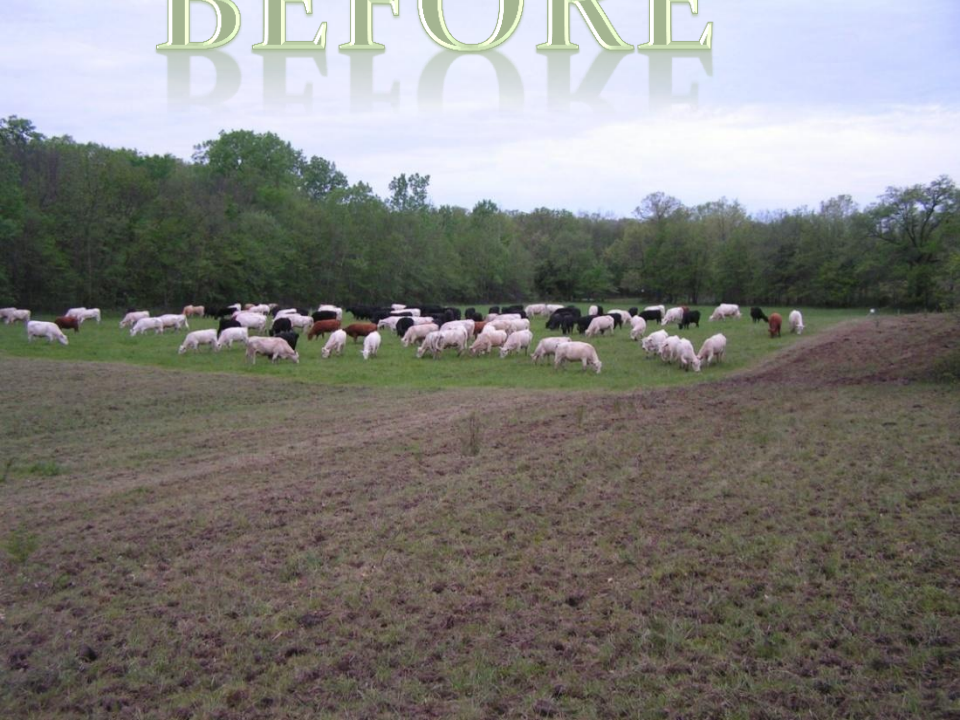
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BEFORE



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AFTER



Building Soil with High Density Grazing

- Rested from March through August
- Then grazed at a stock density of 150,000 lbs./acre



Building Soil with High Density Grazing

- 1 week after grazing
- No clover has been seeded on this field in years, if ever



How does Mob Grazing Build Soil?

- More roots in the soil
 1. Longer rest periods mean more roots
 2. Withstands droughts better.
 3. Pulls minerals from deeper in the soil



Plant Roots: A Component of Pasture Ecology

- The amount of roots sloughing in a year ranges from 25 to 40% of the root biomass.

- Reduced root growth diminishes...
 - the contribution of the root system to soil organic matter
 - plant health & above ground biomass production
 - nutrient uptake and cycling
 - the soil biological community

How does Mob Grazing Build Soil?

- More mulch on the surface of the soil
 1. Feeds the microorganisms
 2. Starts the natural nutrient cycle
 3. Keeps the soil cool so plant roots remain alive and growing
 4. Helps improve infiltration of water
 5. Adds organic matter



Healthy Soils Contain

<u>Type of Organism</u>	<u>number/acre</u>	<u>pounds/acre</u>
Bacteria	800,000,000,000,000,000,000	2,600
Actinomycetes	20,000,000,000,000,000	1,300
Fungi	200,000,000,000,000	2,600
Algae	4,000,000,000	90
Protozoa	2,000,000,000,000	90
Nematodes	80,000,000	45
Earthworms	40,000	445
Insects /arthropods	8,160,000	<u>830</u>
		8000

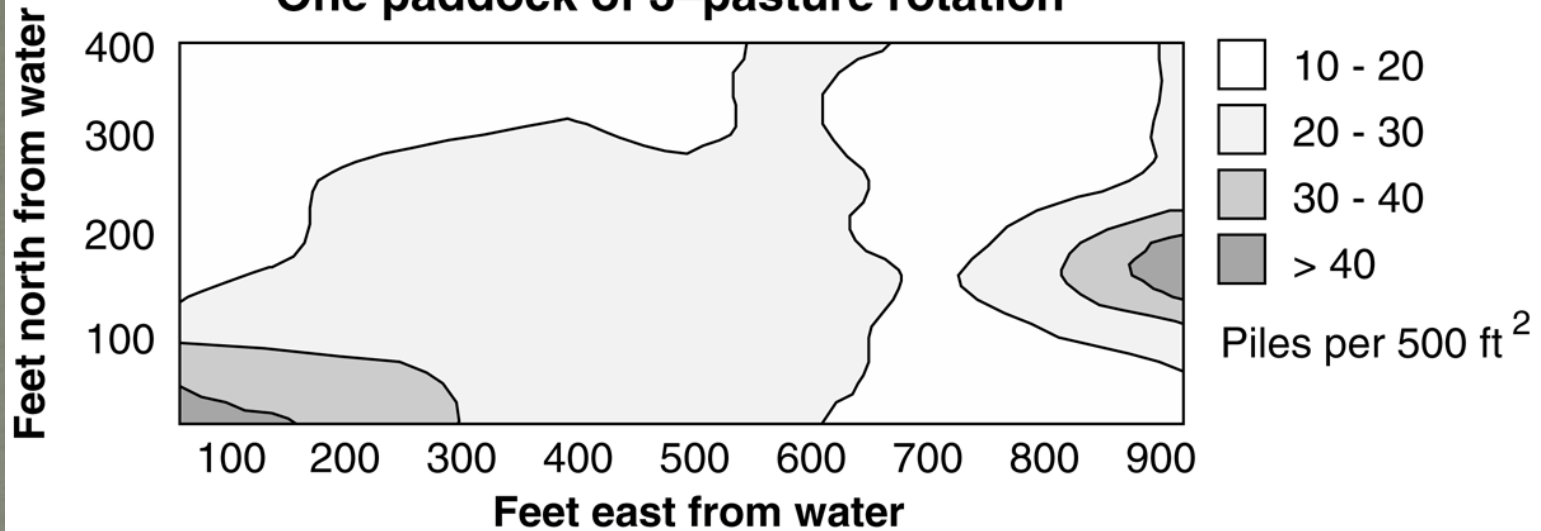


Why does organic matter matter?

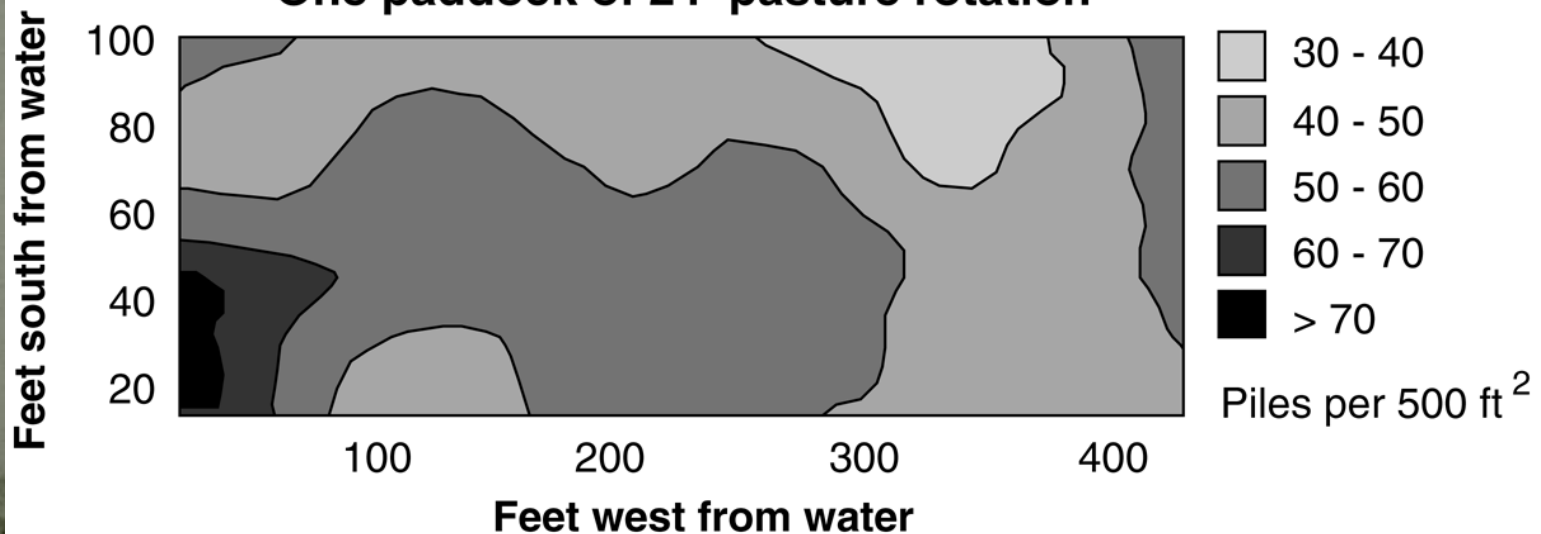
- Each % increase in organic matter holds 3.6 gallons of water per square yard
- Each % increase in organic matter releases 40 pounds of available nitrogen into the soil, each and every year
- Increasing O.M. reduces erosion
- Increasing O.M. will improve soil structure, pH, N,P,K availability)
- The more carbon you have in your soil, the more grass you will grow and the better the quality will stay in the grass

Manure Distribution

One paddock of 3-pasture rotation



One paddock of 24-pasture rotation



Manure Distribution

Rotation Frequency	Years to Get 1 Pile/sq. yard
Continuous	27
14 day	8
4 day	4 – 5
2 day	2
1 day	??
2-6 times a day	??



BEFORE



AFTER



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Weed and Brush Control

- Annuals
 - Ragweed
 - Cocklebur
- Perennials
 - Sumac
 - Ironweed

Weed & Brush Control

- Grazing cocklebur at 250,000 lb. stock density per acre
- Same field after grazing



Weed and Brush Control

Smooth Sumac in St. Clair County



Weed and Brush Control

- Same field after grazing at 100,000 lb. /acre stock density moving 2 times per day



Weed and Brush Control

Ironweed in Putnam County



Weed and Brush Control

- Ironweed grazed at 20,000 lbs stock density



Weed and Brush Control



- Ironweed grazed at 120,000 lbs stock density moved once per day
- There seems to be a change in grazing habits as you get over 100,000 lb. stock density

Mob Grazing

Possible Benefits

- Soil health/Soil Building
- Increased organic matter
- Improved Manure Distribution
- Control of unwanted plants
- Deeper rooted plants- more drought proof

Possible Problems

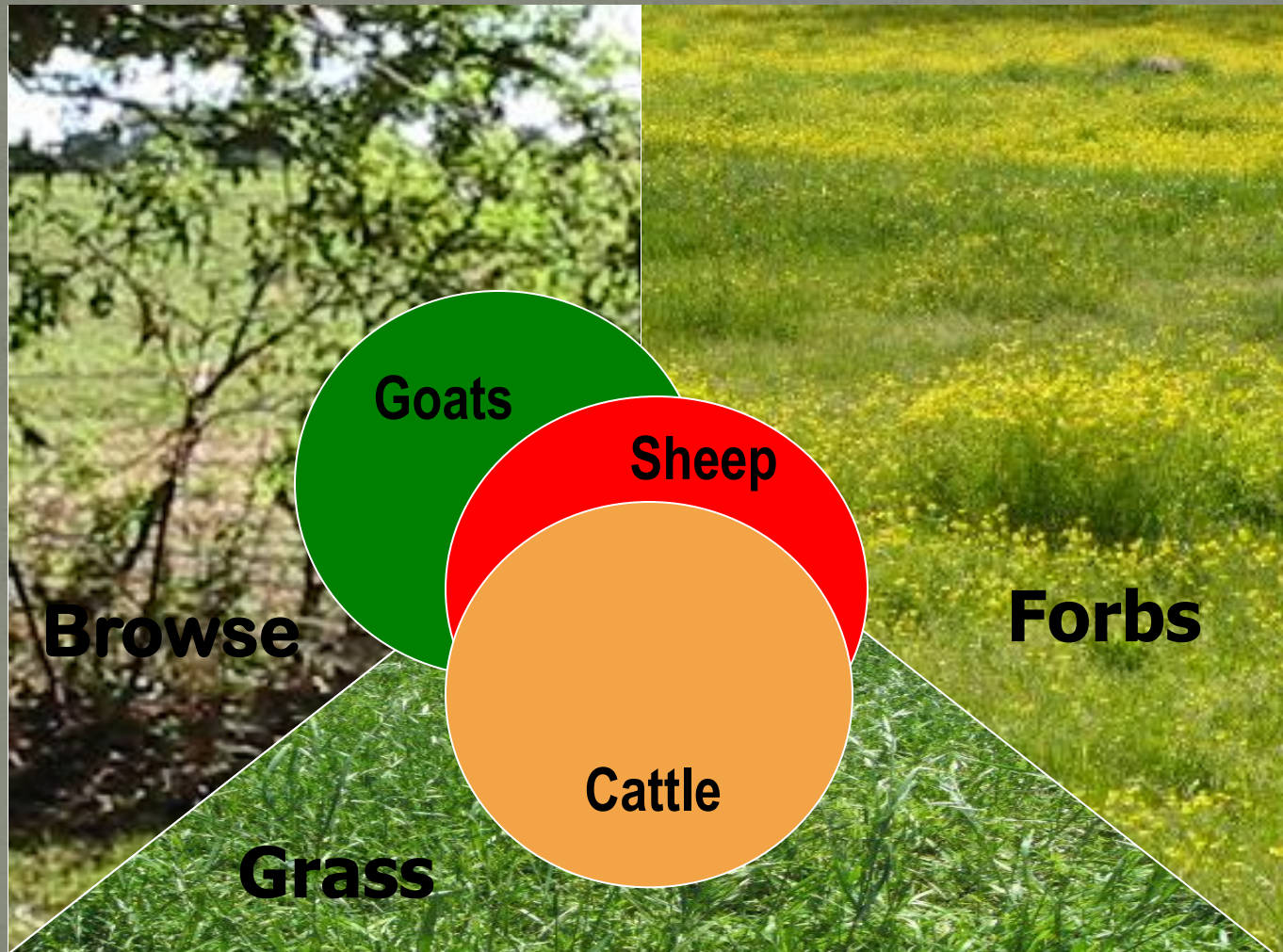
- Requires increased monitoring and management
- Lower forage quality
 - Lowered Animal Performance
- “Scorched earth effect” – utilization too high, not leaving enough residual (litter and standing plants)

WHY add sheep and/or goats to a cattle enterprise?

- Utilization of more plants in a pasture
- Increased carrying capacity
- More total pounds of gain per acre
- More uniform grazing (grazing around dung and urine patches)
- Reproductive efficiency
- Efficient foragers
- Vegetation control
- More profit potential



Multi-Species Grazing Preferences



However, there is regular crossover among the 3 types of feeders as diet preferences and food availability changes throughout the year.

Vegetation Management

- Goats are being used to reduce fuel loads to reduce wildfires
- Goats are being used to control unwanted vegetation on public lands, environmentally sensitive areas where chemicals cannot be used, where mechanical means are too expensive and where landowners or the public desire an environmentally friendly alternative



Vegetation Management

- Sheep and goats are being used to reduce fuel loads to reduce wildfires and are being used to control unwanted vegetation on public lands & environmentally sensitive areas where chemicals cannot be used, where mechanical means are too expensive and where landowners or the public desire an environmentally friendly alternative



Goats in Land and Forage Management

- In a NC State study, after 4 years of goat grazing pastures containing herbaceous weeds, vines, multiflora rose, blackberry and hardwood sprouts, pastures became dominated with grass and clover
- In a West Virginia study goats reduced brush cover from 45% to less than 15% in one season.

Goats in Land and Forage Management

- In an Ohio State University study, goats eliminated 92% of the multiflora rose in 1 season, however it took up to 4 years for total elimination



Controlling Sericea Lespedeza with Goats

- Research and field experience in OK & KS
 - Reduced seeds per stem from 960 to 3
 - No new seedling spread
 - Reduction in stem count (25 – 30%)
- Research at Langston University in OK
 - Stocked at 6-8 goats/ac year 1, 4 – 6/ac. year 2, 3 – 4/ac. year 3
 - End of 3rd year virtually no live sericea plants
 - Left 1 goat/ac. thereafter to control germinating seedlings
 - Weaned goats gained about .3 lb/hd/day during the summer on Sericea

Personal Experience

- I have eliminated buckbrush, ironweed, multi-flora rose, musk thistle and blackberry from pastures in 1 grazing season when that was my goal



Sheep for Weed Control

- Sheep naturally prefer forbs over grasses and grasses over shrubs, so they make good candidates for consuming weedy forbs in a weed-control context.
- In the West, sheep effectively control spotted knapweed (*Centaurea maculosa*), and other aggressive rangeland invaders that are displacing native plant species.



What about Hogs or Chickens?



Hogs can be used to:

- Clean up weather damaged crops
- Eat weeds
- Grub vines and brush
- Fertilize with manure
- Till up pastures for renovation



Pastured Poultry

- Scatter manure from other species
- Deposit their own manure rich in calcium, nitrogen, phosphorous and potassium
- Eat weed seeds & insects
- Mix soil & manure as they scratch for insects



So...What should I do now?

- Inventory existing conditions
- Determine problems and opportunities
- Develop goals or objectives – what you want the future condition to be
- Develop a plan using the tools discussed:
 - Management intensive grazing
 - High Stock Density
 - Multi/Alternate Livestock Species
- Select the right animal/animals
- Monitor
- Make adjustments as needed
- Continue to monitor